

transportation

Studless winter tires

Even better brakes won't help when your tires slip. Remember the "Rickshaw," the mobile equipment transporter pulled on the moon by Alan Shepard during the Apollo 14 mission? Its tires, developed by Goodyear Tire & Rubber Co. for Johnson Space Center, remained pliable at minus 195 F.

Goodyear then used the flexible rubber in a winter radial tire for automobiles. Conventional tires lose their pliability below freezing. The hard rubber begins to bounce, losing surface traction. Steel-studded tires were introduced to increase traction on slick pavement. However, several states have banned studded tires because they destroy road surfaces and are less effective than studless tires on dry surfaces.

The cords of the new tire also are a space spinoff. They utilize the same material developed by DuPont to make the shroud lines for the Viking lander.

When Viking reaches the gravitational pull of Mars this July, a large parachute is to be deployed in the rarified Martian atmosphere to allow the payload to drift gently to the surface. Just three straps of the new fiber will support the brunt of the 2,300-lb weight.

The fiber has a chain-like molecular structure that gives it incredible strength in proportion to its weight. On a pound-for-pound basis, it is five times stronger than steel.



Material developed as parachute shrouds to soft-land the Vikings through the tenuous Martian atmosphere has been adapted to new radial tire by Goodyear being tested here. Five times stronger than steel, the material is expected to increase treadlife by 10,000 additional miles.

Better brakes

A novel composite developed through Ames Research Center's continuing studies on high-temperature space materials may be useful for better brake linings.

Ames worked with the Bendix Corp., which fabricated several combinations of composite materials and evaluated the results. The one selected increases wear rates and lowers costs. It exhibits a constant coefficient of friction at temperatures as high as 650 F, a region where conventional brake linings fade markedly.

A series of full-scale dynamometer tests was completed last year. This year Ames and Bendix will supply brake drums and disks aligned with the new material to the National Highway Transportation Administration for road testing.

The Stanford Research Institute applications team has performed a marketing study and is now seeking organizations interested in commercializing this technology.

Stanford Research Institute's Application Team believes that bus brakes offer the best initial market entry. Wearing of the linings and drums in heavy vehicles is significantly improved and noise is reduced. Other suitable markets include brakes for trucks and industrial equipment such as overhead cranes and hoists. Afterwards, the brake linings could find successful application in passenger cars.

*Composite brake linings,
pliable winter tires,
and a technique to build
smoother highways are among
space spinoffs to transportation.*